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FACT SHEET

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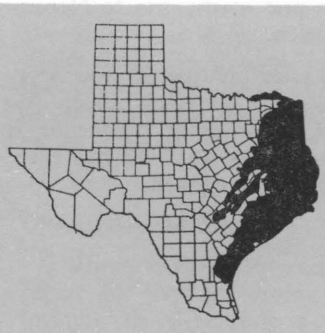

Keys to Profitable Small Grain Production in East Texas and the Coast Prairie

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SOIL AND CLIMATIC CONDITIONS

Most of the small grain acreage in this area is seeded exclusively for grazing. Rainfall ranges from about 29 inches per year to more than 50 inches. Conditions are ideal for leaf diseases, especially cereal rusts, which are usually severe throughout the area. High rainfall in May and June may cause harvesting difficulties. These conditions generally limit grain production to the northern and western portions of the area. Most of the small grains are fall-sown. Where grain is produced, fall-sown grains usually out-produce spring-sown grain, and also provide winter forage. Growers in the northern part should use hardy varieties which can tolerate wide fluctuations in winter temperatures.

Soils should have adequate surface and internal drainage to permit normal growth and root development and to avoid severe damage to the crop by grazing livestock. In some of the flat-wood areas of the Coast Prairie, internal drainage problems prevent successful small grain forage production. Many East Texas soils need and respond favorably to applications of fertilizer.

ROTATIONS

Growing small grains repeatedly on the same land may increase danger of winter grain mite and soil-borne disease damages. Growing small grains in rotation with other crops generally results in more stable production. Maximum profits occur most often when fertilizer and crop rotations are utilized in combination.

SEEDBED PREPARATION

The seedbed should be firm and smooth. Important considerations are: (1) proper depth of preparation to allow penetration and conservation of rainfall; (2) weed control before planting; (3) avoidance of excessive undecomposed organic material in the seed zone near planting time. To aid in control of erosion on land fallowed following a crop, provide minimum tillage for weed control, water penetration and destruction of crop residue.

*Extension agronomist and coordinator of this fact sheet, which contains contributions by numerous staff members in the College of Agriculture, Texas A&M University.

QUALITY SEED

Use good-quality, preferably certified, seed of a recommended variety. Planting seed should be plump, true to variety, have high germination and be free from other crop, weed seed and trash. Trash in planting seed affects drill operation, causing poor seed distribution and uneven stands.

In the grain-producing areas, quality seed are possible at minimum cost by annually planting a small acreage to foundation, registered or certified seed and saving seed from this crop for the next year. Such planting seed, or that purchased from a neighbor, should be free of noxious weeds. Proper cleaning and seed treatments, plus a germination test before seeding, help insure good stands.

Ask your county agent for information on varieties adapted to your area.

SEED TREATMENT

Treat small grain seed with an approved fungicide and an insecticide, if needed. Seedsmen usually treat certified seed with a fungicide. Seed treatment controls some seed-borne diseases and may reduce infection from diseases carried over in the previous crop residue. Seed treatment is good insurance against seedling blights and some smuts. Several effective fungicides with suggested rates follow:

CHEMICAL (TRADE NAMES)	WHEAT, OATS AND BARLEY
Agrox	½ oz. per bu.
Ceresan L	½ oz. per bu.
Ceresan M	½ oz. per bu.
Chipcote 25	¼ oz. per bu.
Chipcote 75	¾ oz. per bu.
Mer Sol 48	¾ oz. per bu.
Ortho LM	¾ oz. per bu.
Panogen 15	¾ oz. per bu.

For the production of *planting seed only,* Vitavax seed protectant may be used to control loose smut of barley and loose smut of wheat. Apply 4 ounces of Vitavax to 100 pounds of seed. The material is compatible with the commonly used barley and wheat seed treatments. *Do not use Vitavax if the crop is to be sold for grain.*

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FERTILIZATION

Base fertilization programs on long-time averages; not on the past year's production performance alone. A soil test is the best means of determining the nutrient status of the soil as well as the amount of fertilizer to apply. The amount of a given nutrient to apply depends on the level of that nutrient in the soil, crop history including residues, available moisture, grazing practices and general management. Send cropping history of fields sampled and grazing management to be followed along with samples to the Soil Testing Laboratory.

Small grains utilized for grain and forage need more fertilizer since forage removed contains a large part of the nitrogen initially applied. Nitrogen requirements are higher when small grains follow high-residue crops, such as grain sorghum.

Apply about half the nitrogen and all the phosphorus and potassium before or at time of seeding. Topdress with additional nitrogen following grazing, depending on moisture conditions. Do not apply nitrogen and potassium above 15 pounds per acre for wheat, rye and barley or 30 pounds for oats directly in the seed furrow. Applying phosphorus with the seed often increases yield, fall growth and cold tolerance especially on those soils low in this nutrient. Phosphorus aids winter-hardiness by increasing seedling vigor and by promoting an extensive root system.

In the absence of soil test information, consider the following fertilizer rates:

MANAGEMENT	LB. PER A.		
	N*	P_2O_5	K_2O**
Grazing plus grain	80 - 120	30 - 40	0 - 40
Grazing only	100 - 150	40 - 80	0 - 80
Grain only	40 - 90	30 - 40	0 - 40

*Apply up to half near planting and topdress remainder in February or March. Use the higher rate on sandy soils and under grazing only.

**Potash on sandy soils only or if experience or soil test indicates a need.

SEEDING DATES AND RATES

Suggested seeding dates for grain and forage production range from early-September to mid-October. For grain production only, seeding dates may vary from October 15 in the northern part of the area to November 15 in the southern portion.

Neither heavy seeding rates nor narrow row spacing appreciably increase total forage yields under dryland conditions. However, early forage production is favored some by heavier seeding rates. On this basis, the following seeding rates are suggested:

CROP	LB. SEED PER A.
Wheat	60 - 75
Oats	64 - 96
Barley	72
Rye	72

WEED CONTROL

Control weeds during seedbed preparation or with herbicides after plants are established. A good crop rotation and weed-free planting seed greatly reduce the weed problem. Small annual and perennial broadleaved weeds can be controlled with ½ to 1 pound per acre of 2,4-D amine or ester. Herbicides are more effective when weeds are small. Spray 2,4-D after the grain has tillered but no later than mid-jointing. Damage from 2,4-D occurs when applied just before and during the boot, heading and flowering stages. Spraying after weeds have competed for soil moisture is not profitable. Large weeds that become established in thin stands of small grain can be controlled with 1 pound per acre of 2,4-D applied after the soft dough stage. Since it takes about 2 weeks for 2,4-D to kill large weeds, make applications as early as possible.

Avoid spraying 2,4-D after susceptible crops such as cotton and vegetables have emerged. In regulated counties, users of hormone-type herbicides must comply with the State herbicide law and regulations.

For detailed weed control information see B-1029, *Suggestions for Weed Control with Chemicals.*

DISEASES

DISEASE	SOURCE OF INFECTION	CONTROL SUGGESTIONS
Leaf rust and stem rust	Air-borne spores	Use resistant varieties when available. Experimental fungicides look promising, but are not practical at this time.
Foot rot, root rot, crown rot, septoria and other leaf spots	Crop residue in soil, air-borne and seed-borne spores.	Rotate with unrelated crops and practice good crop residue management. Treat seed with protectant fungicide.
Loose smut of wheat and barley	Infected planting seed. Infection takes place at heading and infected seed appear the same as those uninfected.	Use seed free of loose smut infection. Produce next year's planting seed from Vitavax-treated seed in fields isolated from other wheat or barley.
Other smuts	Spores of fungus may be on seed or in soil.	Use protectant fungicides as seed treatment.
Wheat streak mosaic	Virus is transmitted by the wheat leaf curl mite.	Destroy volunteer wheat. Avoid early planting where this disease is a problem.
Yellow dwarf	Virus is transmitted by aphids.	Control aphids and use varieties that show less damage when infected.

INSECT CONTROL

Under some conditions, insects may seriously damage small grain in the East Texas and Coast Prairie areas. The fall armyworm is a frequent pest and insecticide applications often are required. Soil insects also may cause damage in local areas. See MP-339, *Texas Guide for Controlling Insects on Grain and Forage Crops.* See L-819, *Greenbugs on Sorghum and Small Grains,* for more information about aphid species on small grains.

GRAZING PRACTICES

Wheat, oats, barley and rye usually provide green forage for livestock during late fall, winter and early spring. Early seeding is necessary for early forage production. Oats are the predominant cereal crop used for grazing in the area. Mixtures are utilized, but usually do not produce more forage than a single variety. They can be used to lengthen the production period (example: early and late variety), and to hedge against winter killing (example: winter and spring variety of oats). They are best seeded in separate fields, but they may be seeded as a mixture. Growth of small grains essentially stops at 40 degrees F. and rank, succulent plants are easily damaged by low temperatures. In the northern part of the area, properly controlled grazing may reduce low temperature damage and save the crop for grain.

Very young small grain plants suffer from severe defoliation. Delay grazing until the plants are well established, 8 to 10 inches high. Stocking rate should be light enough to avoid continuous complete removal of top growth. A field should not be grazed down, particularly during the winter months. The stocking rate should be adjusted to permit moderate grazing by maintaining a visual forage surplus of 25 to 30 percent. If a grain crop is desired, the suggested date for removing livestock varies from north to south but is about February 15 to March 1. To avoid severe injury by spring grazing, remove livestock before the plants begin to joint and before the growing point (starting to develop into a head) gets far enough above the ground level to be removed by grazing. Barley and rye are earlier in heading than wheat or oats and may be injured more by late grazing. Mexican wheats produce considerable early forage, but when grazed, they do not recover well and grain yields can be reduced severely.

Removing top growth on sandy soils may lead to excessive wind erosion. Thin stands also may be damaged by livestock trampling and pulling out of plants. Leave some of the topgrowth to protect the soil and promote plant regrowth.

HARVESTING

Begin harvest when the moisture content of the grain is 12 to 13 percent. Proper combine adjustment will hold harvest losses to a minimum. Wheat varieties vary considerably in tightness of chaff and ease of threshing. Oats have weaker straw than wheat or barley and sometimes present additional problems in harvesting. Storms, wind and rain may cause severe lodging of oats which increases the cost of harvesting and may reduce grain quality. Where lodging or shattering occurs or threatens to occur in an oat crop, where weeds are a problem, or if the grain ripens unevenly, it may be desirable to windrow the oats and use a pick-up attachment to combine the crop. An oat crop usually is damaged less by rains when in the windrow than if it is standing fully ripe.

Oats in the soft dough stage of growth may be used for ensilage. A good oat crop yields 6 to 10 tons of silage. Oats can be made into silage earlier in the season than other crops. If weather permits proper drying, oats also make a valuable hay crop. Cut the crop while the leaves and stems are still green and the grains are in the soft dough stage. Oat straw is the most palatable and nutritious of cereal straws.

Barley makes good-quality hay if cut at the early dough stage and before the awns become hard, although it is not used extensively for hay. Because barley grain is good cattle feed, the recent increases in cattle feeding activity should improve market demand for feed barley grown in the state.

SPRING SEEDING OF SMALL GRAINS

Spring seeding of wheat, oats and barley is not recommended because yields have been much lower than those of fall-seeded varieties. Spring-seeded crops must be seeded and become established during a period of low rainfall, cool temperatures, high winds and spring freezes. When the fall-seeded crop is winter-killed, spring seeding may be substituted, but yields and quality may be lower.

GRAIN MARKETING

Grain producers may elect to (1) contract their crop at a given price to a local buyer before harvest, then fulfill the contract by delivering the grain at harvest for cash; (2) "hedge" their growng crop on the futures market, then liquidate the "hedge" at harvest and deliver the grain to a local buyer; (3) deliver and sell their crop at harvest to a local buyer; (4) store their harvested crop either on-farm or in a commercial elevator for later cash sale; or (5) place their harvested crop in an approved facility where government loan is available for later cash sale either to a local buyer or by redeeming the loan and delivering title of the grain to the government. Others suitably equipped may choose to market all or a portion of their crop for seed purposes.

Each marketing method has advantages and disadvantages. For example, the producer who stores grain at his expense for later cash sale must compute estimated dry matter and moisture shrinkage along with storage-handling and interest costs. These costs must be compared with expected future changes in cash prices to determine the profitability of this option.

ECONOMICS OF PRODUCTION

Increased production efficiency is possible by adopting practices proved through research and result demonstrations. Decisions to adopt improved production practices are made by considering added costs versus added returns because of the change in practices. Production practices which affect costs and income most should receive first consideration. Soil fertility, land preparation, insect control, weed control, disease control, variety selection and harvesting greatly influence the profitability of a small grain crop.

Adequate records and accounts are necessary to determine the profitability of small grain production and to measure progress and make changes in production practices.

Estimated Yield, Price Income, Production Costs, Harvesting Costs and Income Over Specified Costs per Acre for Wheat, Oats & Barley Grazing and Grain Production

	Wheat	Oats	Barley
Yield—bu. per A.	20	40	30
Price—$ per bu.	1.25	.75	.90
Grazing—4 mo. @ $7.75/mo.[1]	31.00	31.00	31.00
Income—per A.[2]	$56.00	$61.00	$58.00
Preharvest costs per A.			
Seed (wheat 1 bu., oats 2 bu., barley 1½ bu.)	$ 2.50	$ 3.75	$ 3.00
Fertilizer—120-40-40	18.00	18.00	18.00
Insecticide	1.00	1.00	1.00
Machinery	2.58	2.58	2.58
Labor	4.32	4.32	4.32
Interest on operating capital—8% for 6 mo.	1.14	1.19	1.16
Total specified preharvest costs	$29.54	$30.84	$30.06
Harvesting cost per A.			
Combining—custom	$ 3.00	$ 3.00	$ 3.00
Hauling—custom, 7¢ per bu.	1.40	2.80	2.10
Total specified harvest cost/A.	$ 4.40	$ 5.80	$ 5.10
Total specified preharvest and harvest cost	$33.94	$36.64	$35.16
Income over specified costs[3]	$22.06	$24.36	$22.84

Cultural Practices, Usual Dates, Times Over Hours per Acre, Costs per Hour, Cost per Acre, for Wheat, Oats and Barley

Cultural practice	Usual dates	Times over	Hr. per A.		Cost per hr.		Cost per A.	
			Labor	Machinery	Labor	Machinery	Labor	Machinery
Break	July	1	1.1	1.	$1.30	$0.86	$1.43	$0.86
Disk	Aug.	1	.83	.75	1.30	.86	1.08	.65
Harrow	Sept.	1	.22	.2	1.30	.86	.29	.17
Plant & Fert	Sept.	1	.72	.65	1.30	.86	.94	.56
Spray	Oct.-Nov.	1	.22	.2	1.30	.86	.29	.17
Fert	Feb.	1	.22	.2	1.30	.86	.29	.17
Harvest	May-June	1	Custom					
Total	Total		3.31	3.00			$4.32	$2.58

[1]Value of grazing less the costs associated with grazing (except fertilizer and other costs shown) light calves (375-400 lb.) for 120 days.

[2]Income does not include government payments.

[3]Costs do not include unallocated overhead costs such as interest, taxes and insurance on farm real estate and machinery, depreciation on farm buildings and machinery and pickup expense.

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